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Jawaharlal Nehru

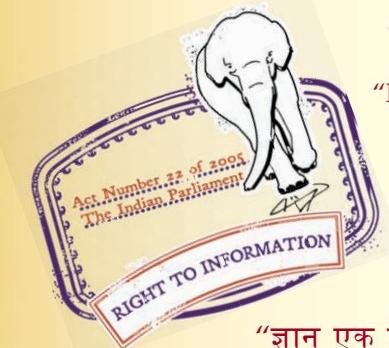
“Step Out From the Old to the New”

IS 7244 (1974): Thermometer for Mercury Barometer [PGD 21:
Meteorological Instruments]

“ज्ञान से एक नये भारत का निर्माण”

Satyanareshwar Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartṛhari—Nītiśākām

“Knowledge is such a treasure which cannot be stolen”



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IS : 7244 - 1974

Indian Standard
SPECIFICATION FOR
THERMOMETER FOR MERCURY BAROMETER

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SPECIFICATION FOR

THERMOMETER FOR MERCURY BAROMETER

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Indian Standard

SPECIFICATION FOR

THERMOMETER FOR MERCURY BAROMETER

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 31 January 1974, after the draft finalized by the Meteorological Instruments Sectional Committee had been approved by the Mechanical Engineering Division Council.

0.2 The mercury barometer is commonly used in India for the measurement of atmospheric pressure for meteorological purposes. Since the barometer reading is a function of its temperature, a thermometer is an essential adjunct to a mercury barometer.

0.3 An Indian Standard for mercury barometers has already been published (*see IS : 5798-1970**). The formulation of a similar standard for thermometers for use with mercury barometers has, therefore, become necessary.

0.4 In the formulation of this standard, due consideration has been given to the requirements laid down by the World Meteorological Organization, Geneva, in addition to the special requirements obtaining in this country.

0.5 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS : 2-1960†. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard covers the requirements for thermometers for use with the mercury barometers conforming to IS : 5798-1970*.

*Specification for mercury barometers.

†Rules for rounding off numerical values (*revised*).

2. TERMINOLOGY

2.1 For the purpose of this standard the definitions given in IS : 2627-1963* shall apply.

3. TYPE

3.1 The thermometer shall be of the liquid-in-glass type, having a solid stem and graduated for vertical total immersion. It shall have a range from -20 to $+50^{\circ}\text{C}$.

4. MATERIAL

4.1 Glass Tubing — The glass capillary and bulb tubing used for the thermometer shall be as prescribed in IS : 4610-1968†.

4.2 Thermometric Liquid — Recommended thermometric liquid is pure and dry mercury, preferably alloyed with 8·5 percent of thallium by mass.

5. DIMENSIONS

5.1 The thermometer shall conform to the dimensions shown in Fig. 1.

6. GENERAL REQUIREMENTS

6.1 Construction

6.1.1 The thermometer shall conform to the shape as shown in Fig. 1. The stem shall be straight, but for a bend near the bulb displacing the centre of the bulb by 4 mm towards the barometer.

6.1.2 No enlargement of the bore shall be permissible in the graduated portion of the stem or within 10 mm of either end of the scale.

6.2 Bulb

6.2.1 The bulb shall be cylindrical. The shape and finish of the bulb shall be such as not to entrap the thermometric liquid.

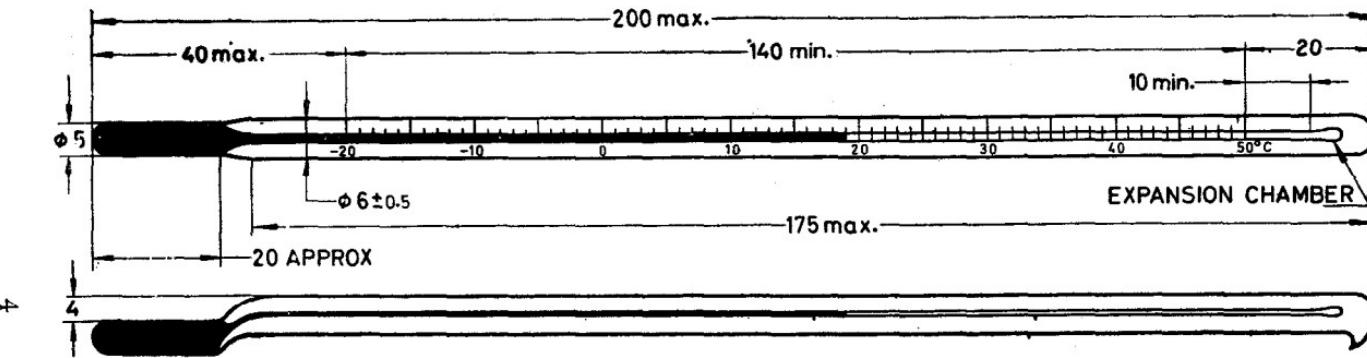
6.2.2 Top Finish — The top of the thermometer shall have a bent nib as shown in Fig. 1.

6.2.3 Expansion Chamber — The thermometer shall be so constructed as to withstand a temperature of 65°C without damage. An elongated or pear shaped expansion chamber with a hemispherical top and without re-entrant shoulders shall be provided at the top end of the capillary in line with the capillary bore to enable the thermometer to withstand the specified range of temperature.

6.2.4 The thermometer shall be suitably annealed before engraving.

*Glossary of terms relating to liquid-in-glass thermometers.

†Specification for glass tubes for general purpose and reference thermometers.



Length of Graduation

1°C	...	3 mm
5°C	...	5 mm
10°C	...	5 mm

All dimensions in millimetres.

FIG. 1 DIMENSIONS FOR THERMOMETER FOR MERCURY BAROMETER

7. GRADUATION AND FIGURING

7.1 The graduation lines shall be clearly engraved on the stem at every full degree Celsius and shall be of uniform thickness not exceeding 0·15 mm. They shall be filled with black pigment.

7.2 The graduation lines shall be at right angles to the axis of the thermometer when viewed from the front, keeping the thermometer in a vertical position. The graduations shall all finish on an imaginary line parallel to the axis on the right-hand side, when viewed from the front as shown in Fig. 1.

7.3 The numerals -20, -10, 0, 10, 20, 30, 40 and 50 shall be etched at the right places on the stem on the right-hand side as shown in Fig. 1.

7.4 The figures shall be placed in such a way that they are bisected by an extension of the line to which they refer; alternately, they shall be placed immediately above the extended line.

7.5 The number of graduations in a length of 20 mm shall not exceed 10.

8. ACCURACY

8.1 Scale Error — The maximum permissible scale error at any point shall be within $\pm 0\cdot2^{\circ}\text{C}$.

8.2 Interval Error — The change of error between two points separated by an interval of 10°C on the stem shall not exceed $0\cdot1^{\circ}\text{C}$.

9. MARKING AND PACKING

9.1 Marking

9.1.1 Each thermometer shall be marked legibly with the following information:

- The letter 'C' near the top of the scale;
- Maker's name or recognized trade-mark, if any, at the back of the thermometer; and
- Serial number of the lot and year of manufacture.

9.1.2 The thermometer may also be marked with the ISI Certification Mark.

Note — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

9.2 Packing — Each thermometer shall be wrapped in a piece of thin tissue paper and packed in a circular cardboard carton; alternately, they shall be suitably packed as agreed to between the purchaser and the supplier.

10. TESTING AND INSPECTION

10.1 Each thermometer shall comply with all the requirements of this standard. The calibration test shall be carried out in accordance with IS : 6274-1971*.

*Method of calibrating liquid-in-glass thermometers.

**INDIAN STANDARDS
ON
METEOROLOGICAL INSTRUMENTS**

IS:

- 4849-1968 Rain measures
5225-1969 Raingauge, non-recording
5235-1969 Raingauge, recording
5793-1970 Aneroid barometers
5798-1970 Mercury barometers
5799-1970 Windvane
5900-1970 Hair hygrograph
5901-1970 Thermograph, bimetallic
5912-1970 Anemometer, cup counter
5924-1970 Clock mechanisms and drum for meteorological instruments
5945-1970 Barograph, aneroid
5946-1970 Whirling psychrometers
5947-1970 Charts for recording meteorological instruments
5948-1970 Thermometer screens
5973-1970 Pan evaporimeter
6805-1973 Assmann psychrometer
6806-1973 Snowgauge
6871-1973 Distant indicating wind equipment

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